

**DETERMINATION OF ACTIVITY CONCENTRATION OF
POTASSIUM-40 AND RADON-222 BY USING ITS DAUGHTER
PROGENY PLUMBUM-214 AND BISMUTH-214 IN WATER FROM
KG.GAJAH, PERAK BY USING GAMMA-RAY SPECTROMETERY**

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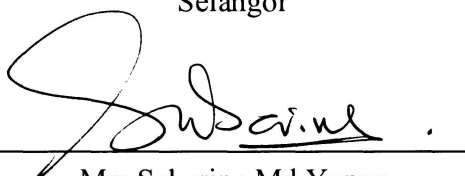
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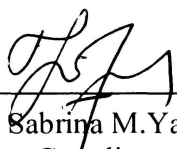
The Final Year Project entitled **“Determination of Activity Concentration of Potassium-40 and Radon-222 by Using Its Daughter Progeny Plumbum-214 and Bismuth-214 in Water by Using Gamma Spectrometry”** was submitted by Emi Suliana Binti Mamat, in partial fulfilment of the requirements for the Degree of Bachelor of Science (Hons.) Chemistry, in the Faculty of Applied Sciences, and approved by



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ABSTRACT

DETERMINATION OF ACTIVITY CONCENTRATION OF POTASSIUM-40 AND RADON-222 BY USING ITS DAUGHTER PROGENY PLUMBUM-214 AND BISMUTH-214 IN WATER BY USING GAMMA SPECTROMETER

In this thesis, the ex-mining's lake at Universiti Teknologi MARA Training Centre, Kampung Gajah, Perak was chosen as a study area to determine the activity concentration of radon-222 in water. The water samples collected were measure using gamma spectrometry, with a Hyper Pure Germanium detector. Water samples were directly filled into Marinelli beaker and seals with PVC tape and store for 3 weeks to allow radon-222 and its daughter nuclides were in radioactive equilibrium before counting. The radon activity concentration is determined by taking the weight average of the concentrations derived from gamma-ray lines associated with plumbum-214 and bismuth-214 decay. Radon-222 cannot directly count by gamma-spectrometer because it is not emitted gamma radiation, but it is alpha emitted radionuclides. The activity concentration of radon was compared for two factors which are wet season and dry season and filtered and unfiltered samples. Activities concentrations of radon-222 were determined. There are no significant variations in radon levels among different locations. For dry season, the concentration of radon-222 levels range from 5.47 ± 1.31 Bq/L to 5.93 ± 1.26 Bq/L for unfiltered samples and 4.84 ± 1.34 Bq/L to 5.34 ± 1.31 Bq/L for filtered samples. While for wet season, the radon concentration levels range from 4.4 ± 1.25 Bq/L to 6.39 ± 1.25 Bq/L for unfiltered samples and 3.45 ± 1.25 Bq/L to 5.56 ± 1.33 Bq/L for filtered samples. For dry season, the concentration levels of potassium-40 are in the range from 88.03 ± 4.61 Bq/L to 103.95 ± 3.73 Bq/L for unfiltered and 84.93 ± 4.86 Bq/L to 102.24 ± 4.73 Bq/L for filtered samples. While for dry season, the concentration of potassium-40 is the range from 85.51 ± 4.51 Bq/L to 93.70 ± 4.64 Bq/L for unfiltered samples and for filtered samples is from 74.03 ± 5.60 Bq/L to 87.72 ± 5.08 Bq/L.